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CHUANG(10) **Pub. No.: US 2018/0184797 A1**(43) **Pub. Date: Jul. 5, 2018**(54) **ULTRA-THIN LIFTING TABLE**(71) Applicant: **KELLY INTERNATIONAL CORP.**,
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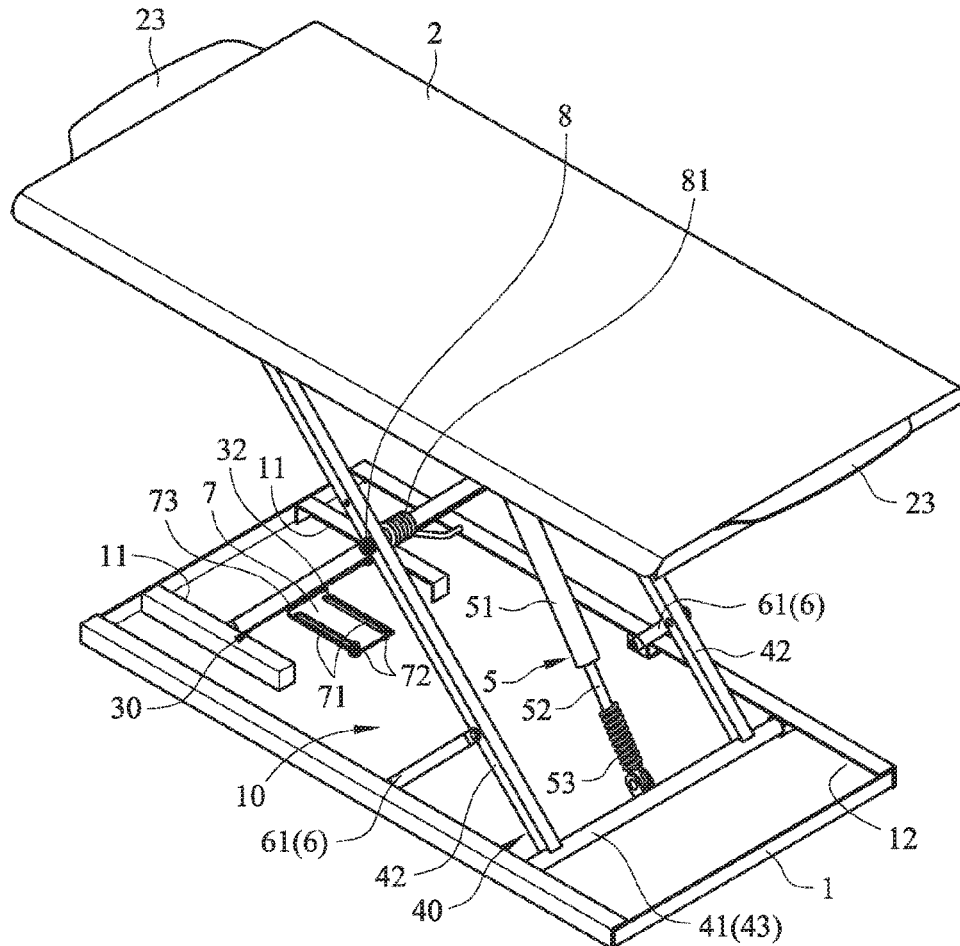
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ABSTRACT

An ultra-thin lifting table includes a lower platform, an upper platform, a movable brace, and a gas-assisted extension strut. The upper platform is located above the lower platform and configured to move up and down with respect to the lower platform. The movable brace includes an inner frame and an outer frame that are crossed and pivotally connected. The inner and outer frames are nested together and installed between the upper and lower platforms. Pivot of the inner and outer frames drives the upper platform to move up and down with respect to the lower platform. The gas-assisted extension strut provides gas-assisted thrust and is pivotally connected between the inner and outer frames for generating a lifting force when the inner and outer frames have an angle of cross therebetween. Thereby, when folded down, the inner and outer frames are horizontally placed between the upper and lower platforms.



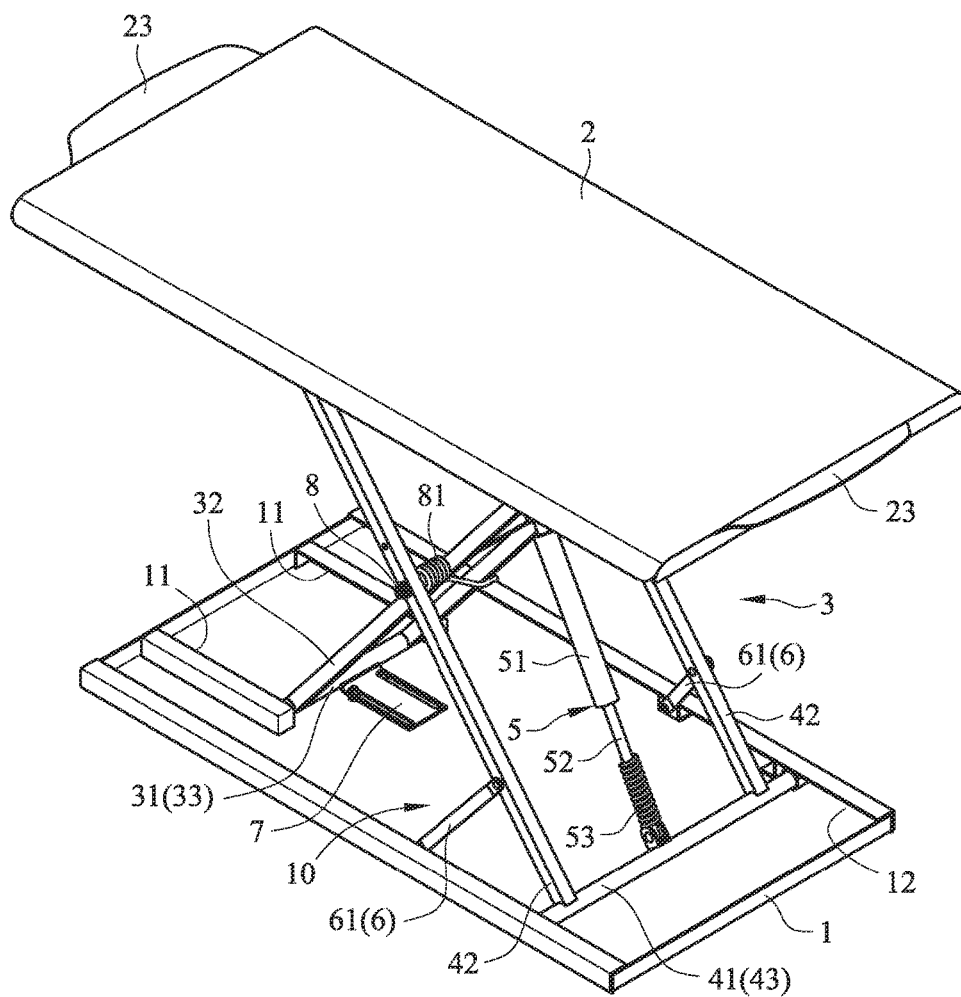


FIG.1

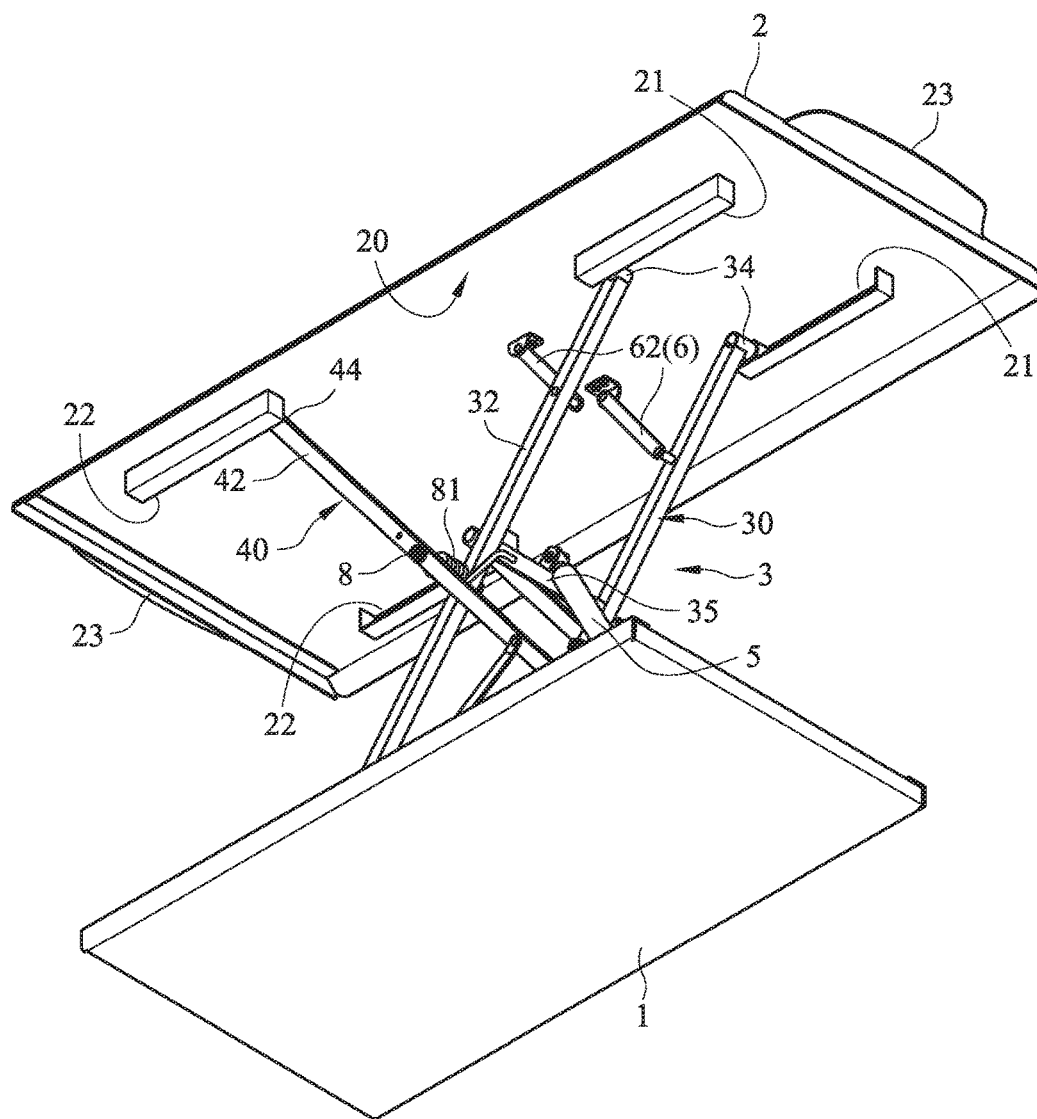


FIG.2

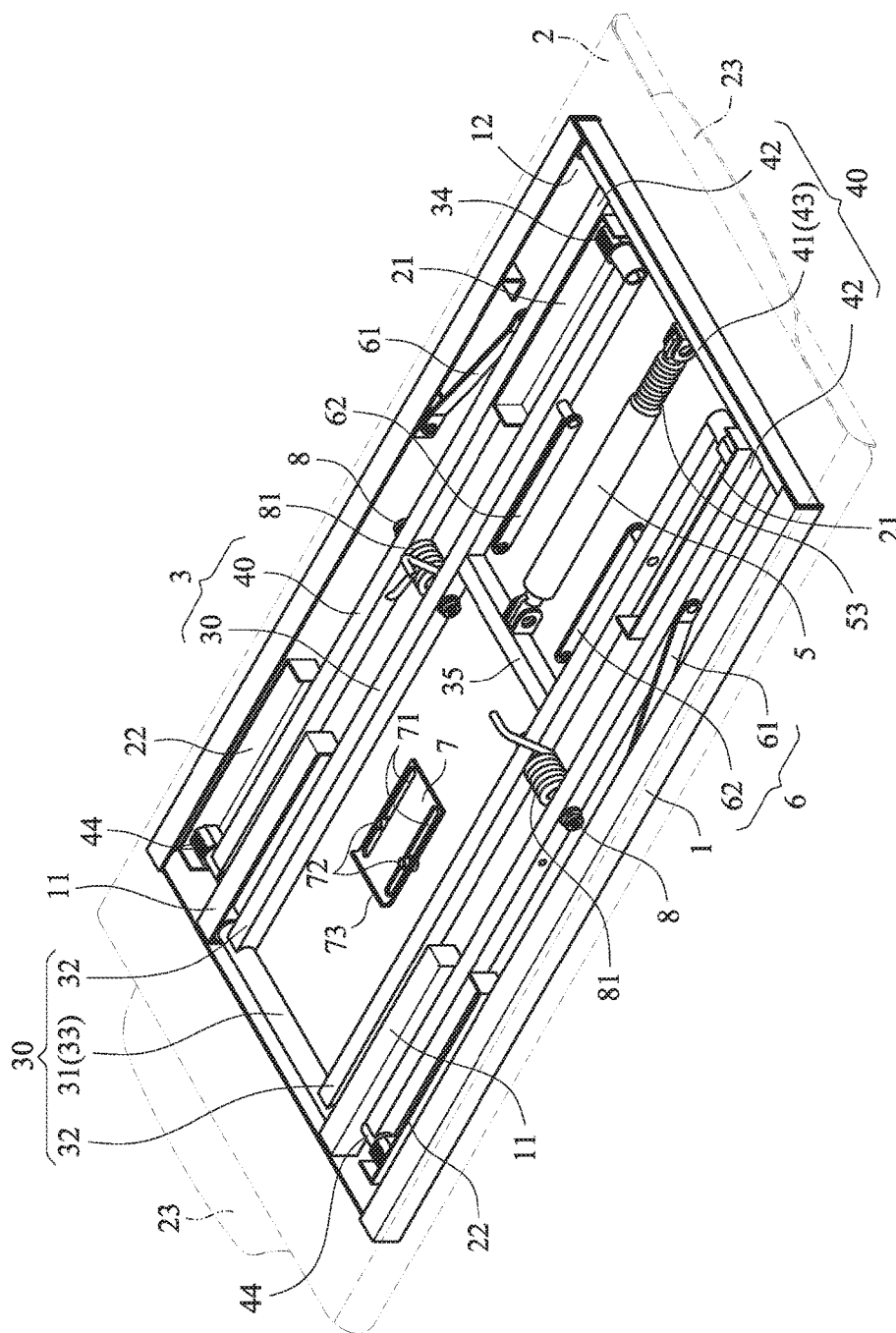
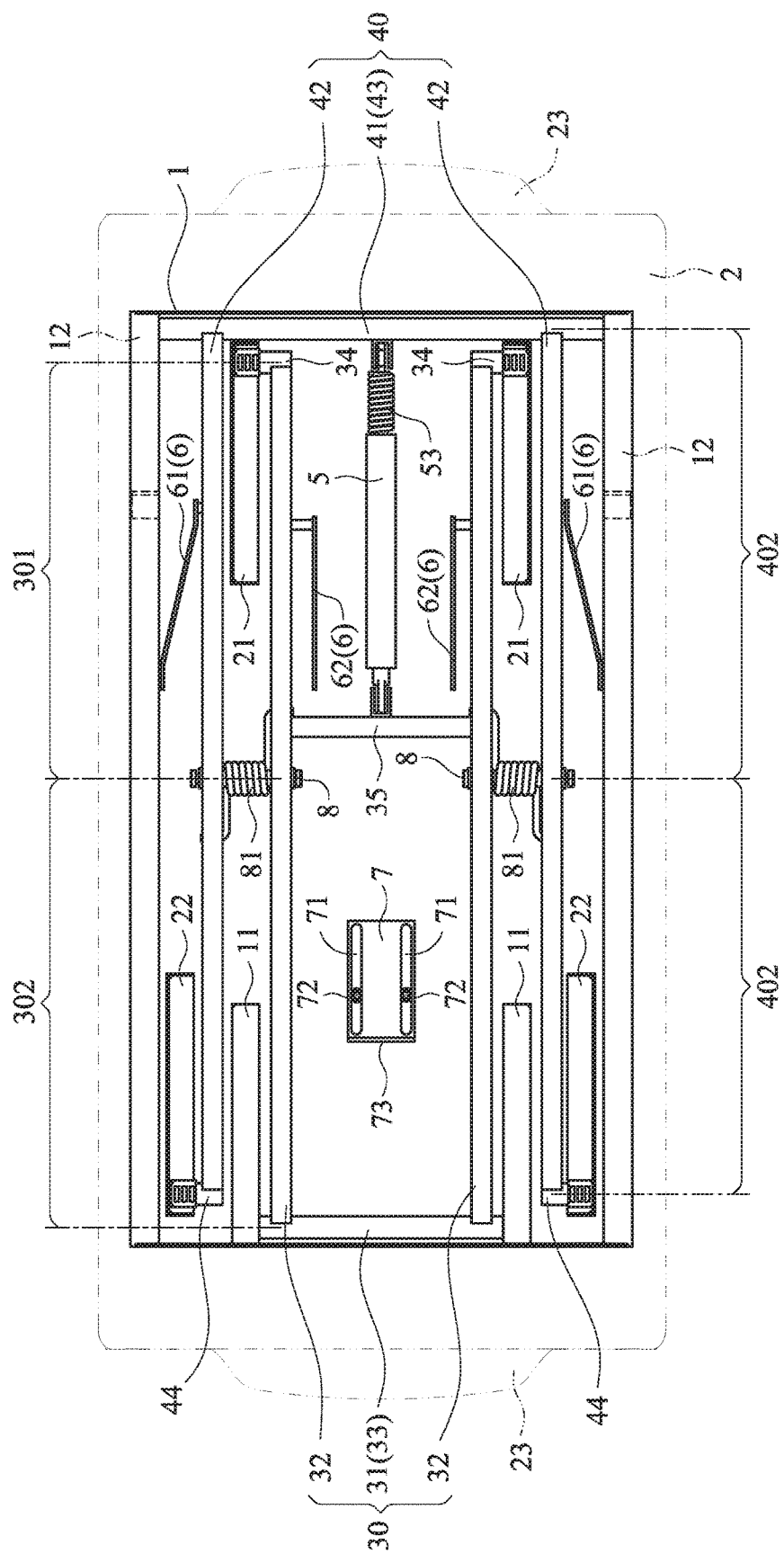


FIG.3



4
G
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L

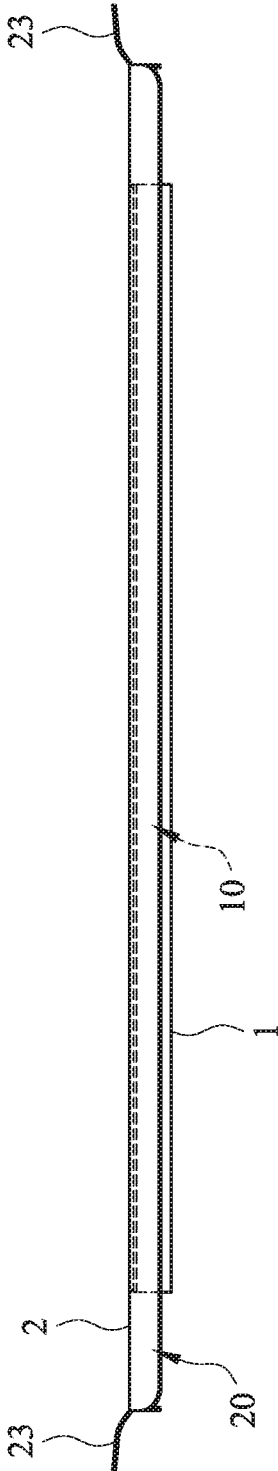


FIG. 5

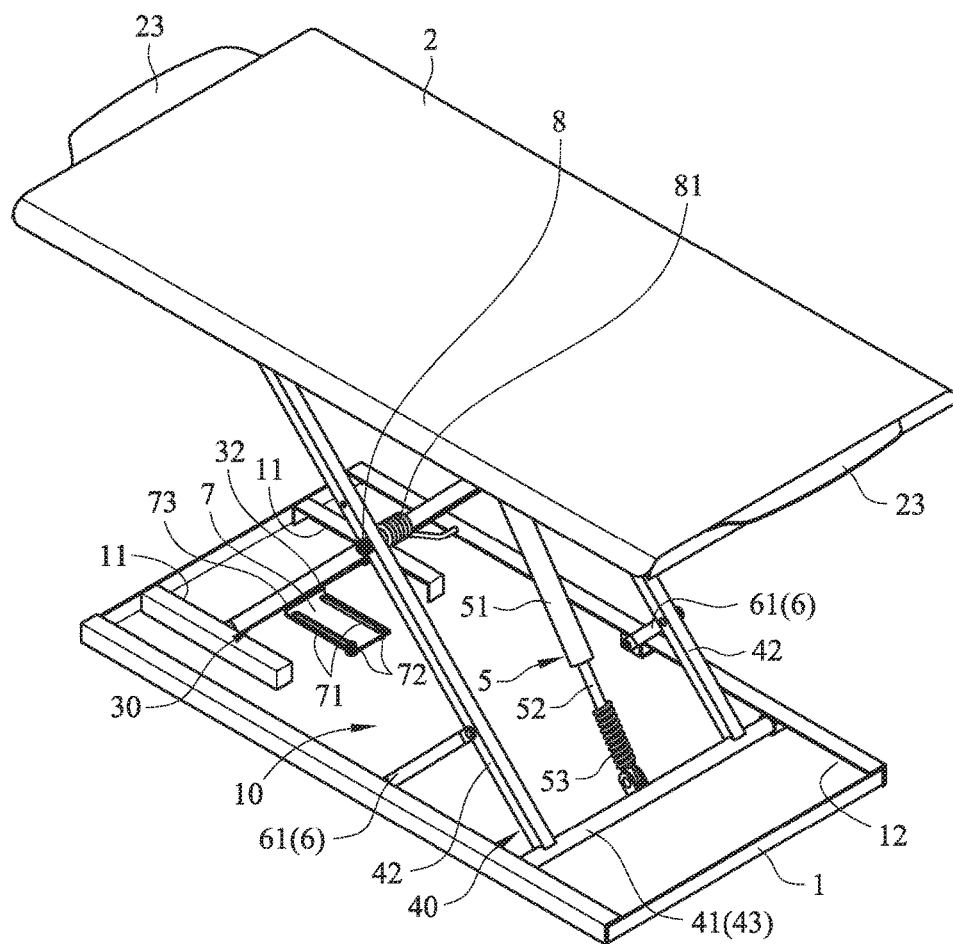


FIG.6

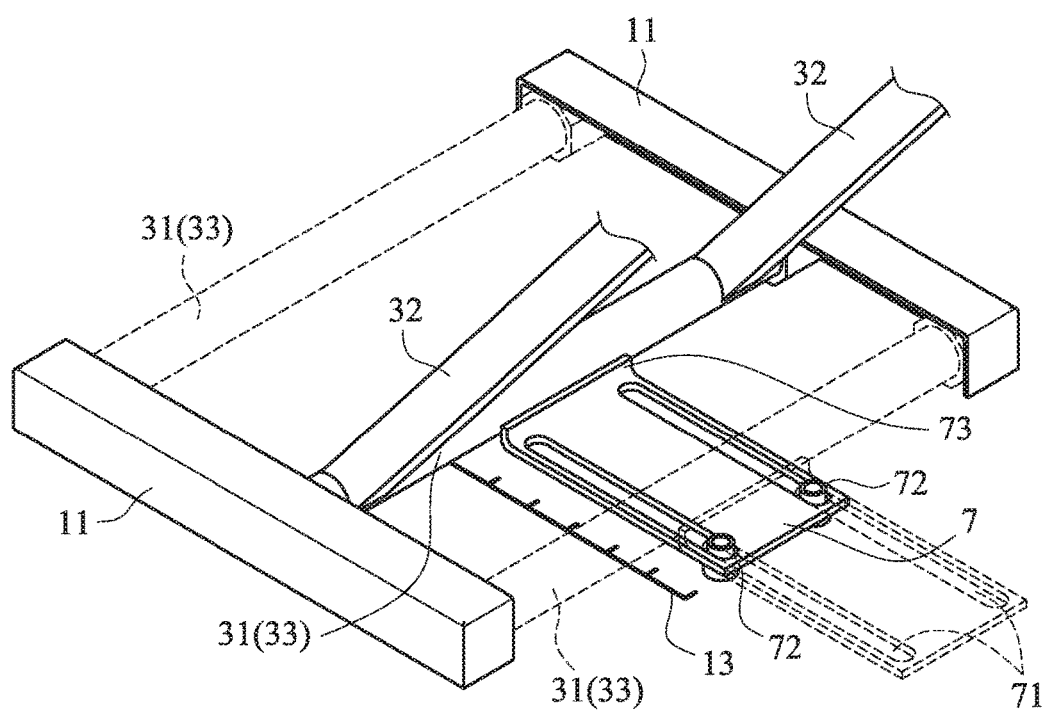


FIG.6a

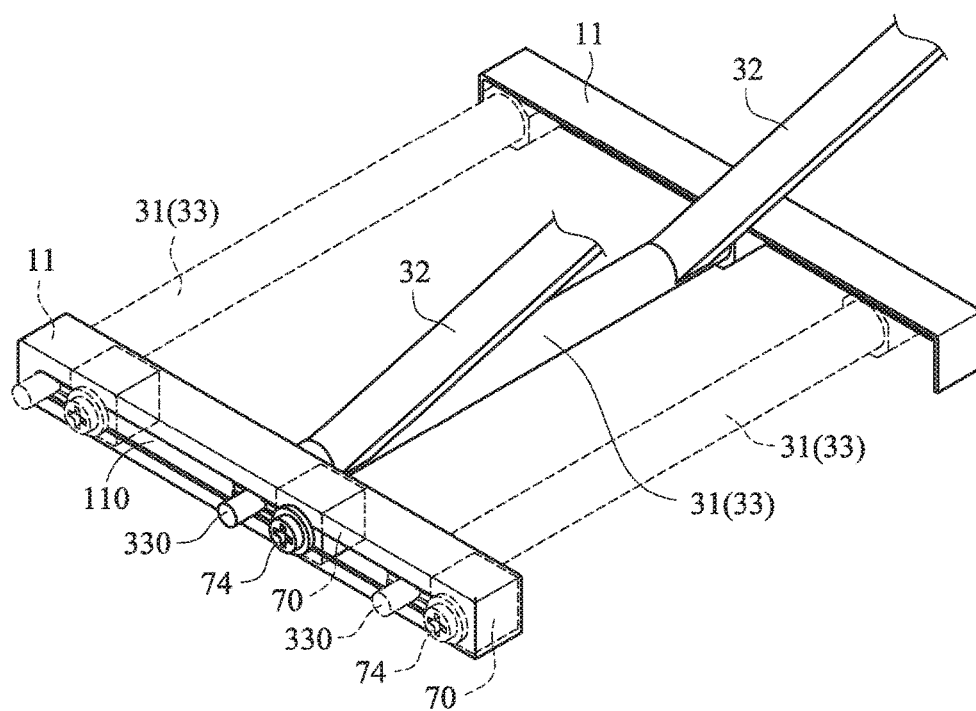


FIG.6b

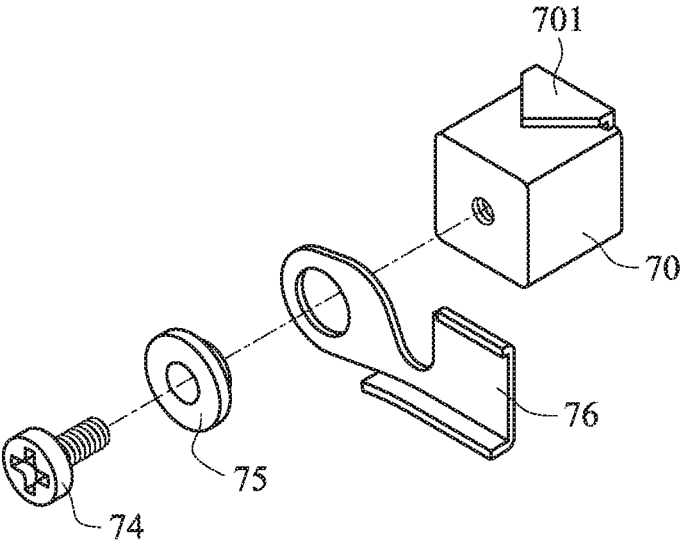


FIG.6c

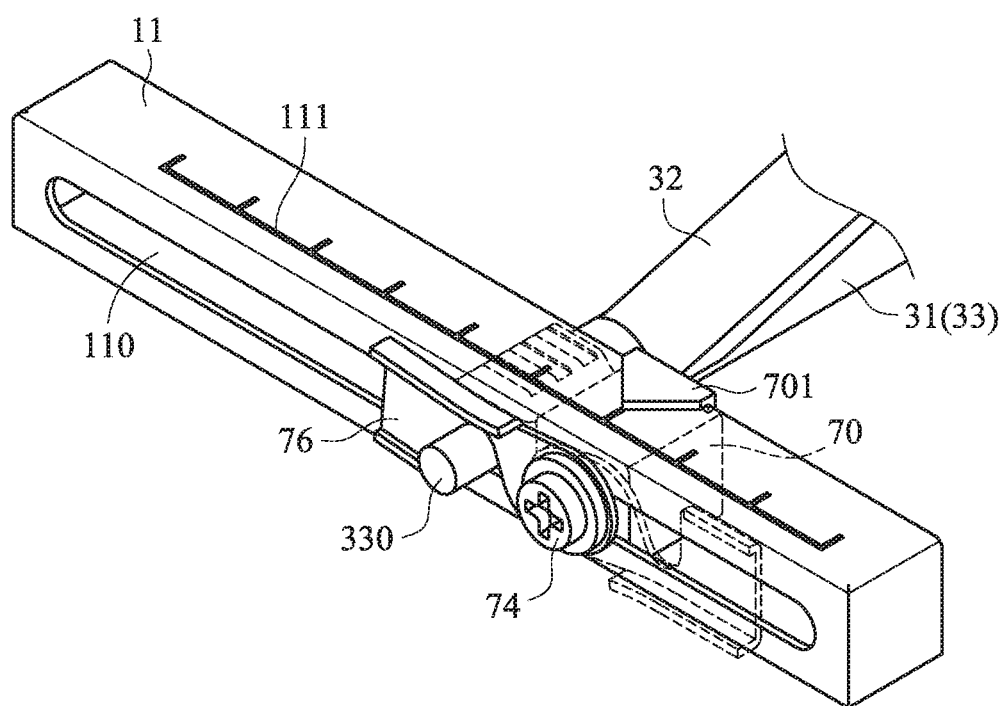


FIG.6d

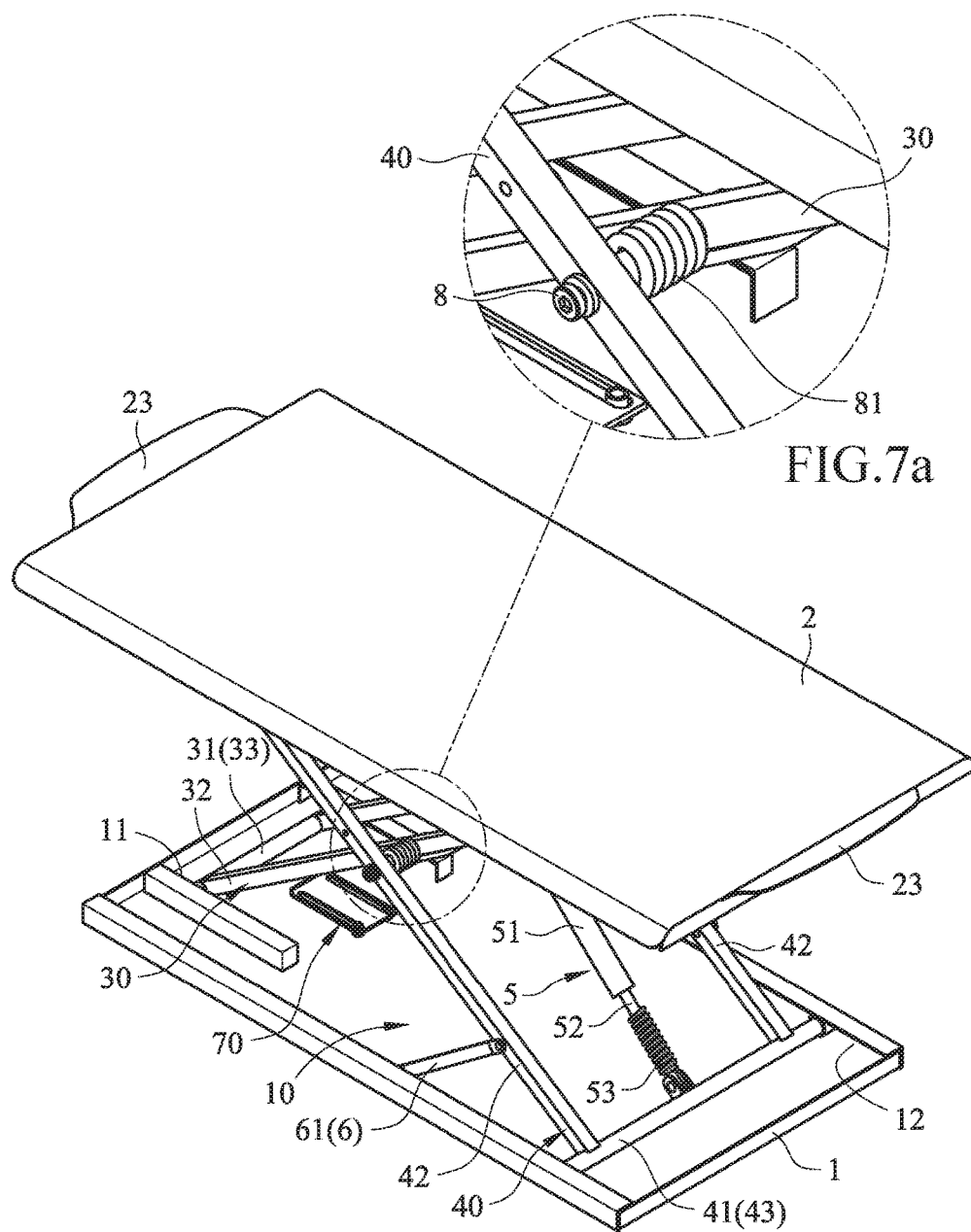


FIG. 7

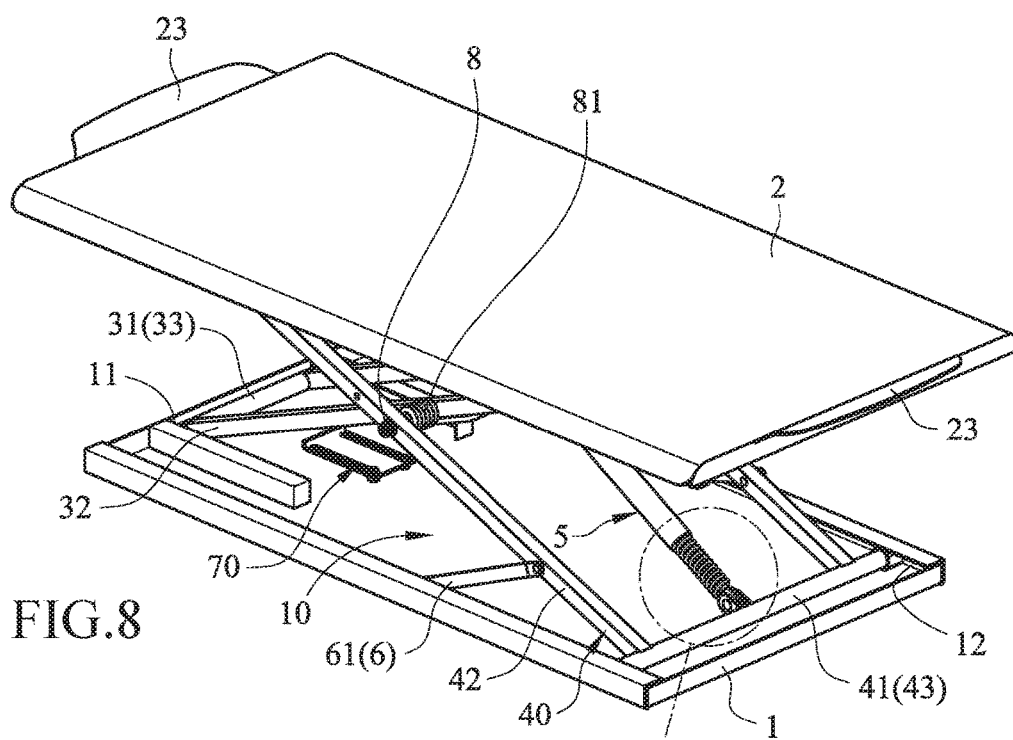


FIG. 8

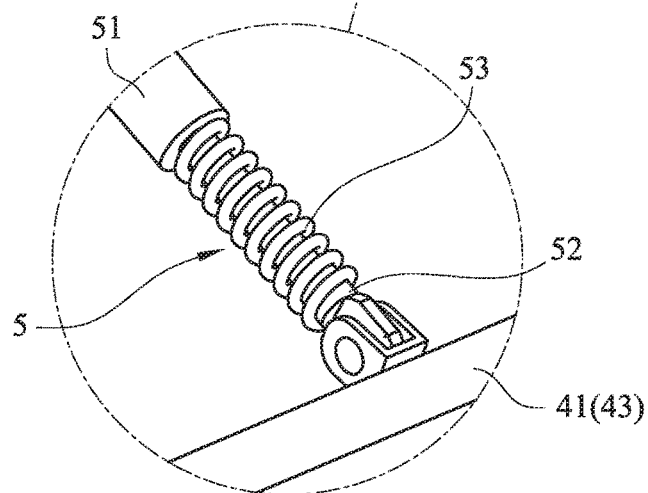


FIG. 8a

ULTRA-THIN LIFTING TABLE

BACKGROUND OF THE INVENTION

1. Technical Field

[0001] The present invention relates to desktop lifting devices, and more particularly to an ultra-thin lifting table that has crossed and pivotally connected frames so as to have a reduced height when folded down.

2. Description of Related Art

[0002] In this modern world, people's daily life is highly interlaced with computers, networks, and communications. This makes us spend most time of a day in front of computers to handle things, browse news, learn knowledge, or communicate remotely, for either work or personal life. Therefore, the risk of healthy issues due to long-time sitting or poor sitting postures is threatening people increasingly.

[0003] There are many lifting platforms/lifting tables on the market that are used to change height of things placed thereon and to prevent the foregoing healthy risks by allowing user to conveniently change postures between sitting and standing. Such a conventional desktop lifting platform/lifting table usually has a base to be installed or placed on a desk top, and an electric drive to make its platform move upward or downward with respect to the desk top. Depending on their working mechanisms, the known lifting platforms can be divided into many different types. One of these types, for example, involves performing vertical movement along a standing post. However, the standing post is not foldable and thus less space-efficient, and the entire device's installation and displacement are relatively inconvenient. The existing lifting platforms of another type use a pivotal arm to perform lifting. Nevertheless, when moving upward, the platform can incline forward or backward in its pivotal route (opposite to vertically moving upward and downward), making it less suitable to occasions where special restriction is a concern. In addition, there is a type called the scissor type, which works depending on two pivotally crossed supports. Although the scissor-type lifting platforms allow vertical lifting, they still have some structural defects. Besides, a lifting platform is relatively bulky due to its electric mechanism, and thus is usually fixedly installed, making it less maneuverable. Even if the device is folded down (at its lowest position), it has a significant thickness, forming a considerable height difference with the desk top, so the use is less comfortable.

[0004] Additionally, a known scissor lifting device, such as the vehicle scissor lift disclosed in U.S. Pat. No. 4,899, 987, has two independent supports crossed and pivotally connected to each other, wherein the two supports have their ends at the same side of the device fixedly pivotable while their opposite ends are slidably pivotable, so as to form a scissor lifting device that is slidably at one side. If such a configuration is applied to a lifting table, it can be structurally simplified and lightweighted due to the reduced load demand, but this also means its overall supporting strength is decreased. As a result, when the platform moves upward, the supporting force would gradually shift toward the side with the fixed connection, or the fixed side, (opposite to the side with slidable connection, or the slidable side). Where the load puts its most weight on the slidable side, the device

tends to become instable or even turn over. This is a problem of the known scissor lifting devices with single side slide needs to overcome.

[0005] By comparison, the lifting table of U.S. Pat. No. 3,823,915 is more stable. This known device has support components that are crossed like a scissor and are pivotable with respect to each other. The two ends of the support components are slidably and pivotally connected between the lower base and upper platform, and a positioning link is provided intermediately for link, so that the support components can slide at two sides toward the center. Thereby, during either the upper platform's folding up or down, the supporting force can be stably held at the center, without the risk of shifting. However, although the known device prevents unbalanced supporting force at two sides, it still has shortcomings in terms of synchronous movement and interference between components for the upper platform to move stably and smoothly. Besides, when used as a desk-top lifting device, the known structure still has a considerable thickness, making it fail to meet users' needs.

[0006] In view of the shortcomings of the conventional lifting platforms, and with consideration to the modern working demands about convenience and maneuverability, the inventor has paid extra effort to improve the prior art with the present invention.

BRIEF SUMMARY OF THE INVENTION

[0007] The primary objective of the present invention is to provide an ultra-thin lifting table, which is a desktop lifting table that can be installed or placed on an existing office desk top. With a nesting-arranged movable brace, the ultra-thin lifting table when folded down can save significantly space, and is light and compact. It can be easily moved and set up, and when folded down it has a reduced height difference with the desk top, thereby allowing convenient and comfortable use.

[0008] The disclosed ultra-thin lifting table uses reverse-U-shaped inner and outer frames that are crossed and pivotally connected for pivoting synchronously and the scissor-type lifting table is slidable at both sides so as to provide a balanced supporting force lift, thereby ensuring stable and smooth lifting operation, and satisfying the modern working demands that seek for high versatility and high maneuverability.

[0009] Furthermore, the present invention uses the accommodating spaces of the upper and lower platforms to accommodate the folded mechanism, further reducing the overall minimum thickness, and making the lifting table ultra-thin in structure and comfortable in use.

[0010] To achieve the foregoing objective, the ultra-thin lifting table of the present invention adopts the technical scheme that it comprises a lower platform, an upper platform, a movable brace, and a gas-assisted extension strut. The upper platform is located above the lower platform and configured to move up and down with respect to the lower platform, and has a folded-down position and at least one folded-up position. The movable brace comprises an inner frame and an outer frame that are crossed and pivotally connected to each other. The inner and outer frames are nested together and installed between the upper and lower platforms. The inner and outer frames each have two ends thereof slidably connected to the lower platform and the upper platform, respectively, so that pivot performed by the inner and outer frames drives the upper platform to move up

and down with respect to the lower platform. The inner frame or the outer frame is pivotally provided with at least one positioning link pivotally linked to the lower platform or the upper platform to get positioned, so that the movable brace is allowed to pivot and slide with a travel of the positioning link, the inner frame comprising two inner-frame props and an inner-frame transverse bar connected to ends of the two inner-frame props. The outer frame comprises two outer-frame props and an outer-frame transverse bar connected to ends of the two outer-frame props. The two inner-frame props are crossed and pivotally connected to the two outer-frame props, respectively. The inner frame includes an upper inner-frame segment and a lower inner-frame segment bordered at where the inner-frame props are crossed and pivotally connected to the two outer-frame props. The outer frame includes an upper outer-frame segment and a lower outer-frame segment bordered at where bordered at where the inner-frame props are crossed and pivotally connected to the two outer-frame props. The upper inner-frame segment has a length equal to a length of the upper outer-frame segment. The lower inner-frame segment has a length equal to a length of the lower outer-frame segment. The length of the upper inner-frame segment is greater than or smaller than the length of the lower inner-frame segment, so that when the inner frame and the outer frame are both parallel to the lower platform, the upper platform is in the folded-down position and parallel to the lower platform, and when the inner frame and the outer frame have an angle of cross therebetween, the upper platform is in the folded-up position and parallel to the lower platform. The gas-assisted extension strut provides a gas-assisted thrust and is pivotally connected between the inner and outer frames, for forming a lifting force when the inner and outer frames have an angle of cross therebetween. Therein, the inner frame and the outer frame has an identical unit thickness, and when the upper platform is in the folded-down position, the inner and outer frames are nested together and parallel to the lower platform so that the movable brace has an overall thickness that is equal to one said unit thickness.

[0011] With the fore going configuration, in a preferred aspect of the present invention, the lower platform has a surface thereof depressedly formed with a lower accommodating space of the unit thickness, so that when the upper platform is in the folded-down position, the inner frame and the outer frame are horizontally placed in the lower accommodating space. The upper platform is greater than the lower platform in terms of area, and the upper platform has a bottom surface thereof depressedly formed with an upper accommodating space of at least the unit thickness, so that when the upper platform is in the folded-down position, the lower platform is received in the upper accommodating space.

[0012] Preferably, the gas-assisted extension strut has two ends thereof pivotally connected to the upper inner-frame segment and the outer frame lower end, respectively, or pivotally connected to the lower inner-frame segment and the upper outer-frame segment, respectively.

[0013] Preferably, the positioning link comprising at least one lower positioning link and at least one upper positioning link, the lower outer-frame segment is pivotally provided with the lower positioning link, and the lower positioning link is further pivotally connected to the lower platform to get positioned, while the upper inner-frame segment is

pivotally provided with the upper positioning link, and the upper positioning link is further pivotally connected to the upper platform to get positioned.

[0014] Preferably, each of the inner-frame props has its lower end connected to a lower inner guide track on a top surface of the lower platform through an inner lower slide shaft, and each of the inner-frame prop has its upper end connected to an upper inner guide track on a bottom surface of the upper platform through an inner upper slide shaft, while each of the outer-frame props has its lower end connected to a lower outer guide track on the top surface of the lower platform through an outer lower slide shaft, and each of the outer-frame props has its upper end connected to an upper outer guide track on the bottom surface of the upper platform through an outer upper slide shaft, in which the lower inner guide track, the upper inner guide track, the lower outer guide track, and the upper outer guide track are parallel to each other, and when the upper platform is in the folded-down position, the lower inner guide tracks are inside the upper outer guide tracks while the upper inner guide tracks are inside the lower outer guide tracks.

[0015] In a preferred aspect of the present invention, the upper inner-frame segment has a length smaller than a length of the lower inner-frame segment, and the inner-frame transverse bar is defined as the inner lower slide shaft while the outer-frame transverse bar is defined as the outer lower slide shaft.

[0016] Preferably, the gas-assisted extension strut has one end thereof pivotally connected to the outer-frame transverse bar, and an opposite end thereof pivotally connected to the upper inner-frame segment.

[0017] Preferably, a positionally adjustable retaining member is set in a moving route of any one of the inner lower slide shaft, the inner upper slide shaft, the outer lower slide shaft, and the outer upper slide shaft, in which the retaining member is adjusted to limit a range the corresponding slide shaft is allowed to slide, thereby limiting an angle the inner and outer frames are allowed to expand, and in turn limiting a maximum height where the upper platform is allowed to be lifted to.

[0018] Therein, in a preferred aspect of the present invention, the retaining member is set in the moving route of the inner lower slide shaft, and located at the top surface of the lower platform, in which the retaining member has a raised retaining portion for retaining the inner-frame transverse bar, and two parallel slots each for a positioning piece to pass therethrough and be screwed into the top surface of the lower platform, thereby adjustably fixing the retaining member to the top surface of the lower platform.

[0019] In addition, in another preferred aspect of the present invention, the retaining member is set in the moving route of the inner lower slide shaft, and is located in one of the lower inner guide tracks, in which the retaining member is configured to slide with respect to the lower inner guide track and to engage with an adjustable positioning piece, so as to fix a relative position of the retaining member in the lower inner guide track, thereby retaining the inner lower slide shaft when the retaining member is fixed.

[0020] Furthermore, the lower inner guide track is laterally formed with a slot, and the inner lower slide shaft has an extension portion jutting out of the slot, while the positioning piece passes through the slot from outside to engage with the retaining member, in which the positioning piece is coupled with a rotatable hook for hooking the

extension portion to fix the relative position between the retaining member and the inner lower slide shaft. Further, a scale is provided at an outer side of the lower inner guide track for expressing a height of the folded-up position, and an indicator is extended outward from the retaining member to be aligned with the scale.

[0021] Preferably, the inner and outer frames are crossed and pivotally connected through a cross pivot, and the cross pivot further has a buffering member, in which the buffering member is located between the inner and outer frames so that when the inner and outer frames pivot are almost parallel to the lower platform, the buffering member receive pressure and provides a buffering force.

[0022] Preferably, the gas-assisted extension strut comprises an outer rod and an inner rod that are telescoped for extension and retraction, and a spring member is further mounted around the inner rod to provide a return force after receiving a pressure.

[0023] Preferably, the upper platform has its two sides further provided with projecting handles for convenient grip and operation.

[0024] The invention as well as a preferred mode of use, further objectives and advantages thereof will be best understood by reference to the following detailed description of illustrative embodiments when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0025] FIG. 1 is a perspective view of a lifting table of one embodiment of the present invention in its folded-up position.

[0026] FIG. 2 is another perspective view of the lifting table taken from a direction opposite to that of FIG. 1.

[0027] FIG. 3 is a perspective view of the lifting table of FIG. 1 in its folded-down position.

[0028] FIG. 4 is a plane view of the lifting table of FIG. 1 in its folded-down position.

[0029] FIG. 5 is a side view of the lifting table of FIG. 1 in its folded-down position.

[0030] FIG. 6 shows that the lifting table of FIG. 1 is retained by its retaining member.

[0031] FIG. 6a shows that a retaining member is set in the moving route of the inner lower slide shaft for retaining.

[0032] FIG. 6b shows that another retaining member is set in the moving route of the inner lower slide shaft or retaining.

[0033] FIG. 6c is an exploded view of the second retaining member that has an indicator and a hook.

[0034] FIG. 6d shows that the second retaining member uses the hook to fix the inner lower slide shaft.

[0035] FIG. 7 shows that a buffering member of the lifting table of FIG. 1 is under pressure.

[0036] FIG. 7a is a partial, enlarged view of FIG. 7.

[0037] FIG. 8 shows that a spring member of the lifting table of FIG. 1 is under pressure.

[0038] FIG. 8a is a partial, enlarged view of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

[0039] Referring to FIG. 1 through FIG. 4, an ultra-thin lifting table of the present invention primarily comprises a

lower platform 1, an upper platform 2, a movable brace 3, a gas-assisted extension strut 5, and a retaining member 7.

[0040] The lower platform 1 has a horizontal lower surface, and has its upper surface depressed to form a lower accommodating space 10. The lower accommodating space 10 accommodates two transverse lower inner guides groove 11 in its left part, and accommodates two transverse lower outer guide tracks 12 in its right part. The two lower outer guide tracks 12 flank the two lower inner guide tracks 11, and they are parallel to each other.

[0041] The upper platform 2 is located above the lower platform 1 and has a horizontal upper surface. The surface has its two sides each laterally extended with a handle 23 for convenient grip and operation. The upper platform 2 is greater than the lower platform 1 in terms of area, and has its bottom side depressedly formed with an upper accommodating space 20. The upper accommodating space 20 is greater than the lower platform 1 in terms of profile. Two transverse upper outer guide tracks 22 are formed in the left part of the upper accommodating space 20, and two transverse upper inner guide tracks 21 are formed in the right part of the upper accommodating space 20. The upper outer guide tracks 22 flank the upper inner guide tracks 21 from outside. These guides are parallel to each other and are also parallel to the lower outer guide track 12 and the lower inner guide track 11 of the lower platform 1.

[0042] The movable brace 3 primarily comprises an inner frame 30 and an outer frame 40 that are crossed and pivotally connected to each other. The inner and outer frames 30, 40 are nested together and installed between the upper and lower platforms 2, 1. The inner and outer frames 30, 40 are reverse-U-shaped supports, crisscross arranged, formed by rods made of the same material and have the same unit thickness. Therein, the inner frame 30 comprises an inner-frame transverse bar 31 and two inner-frame props 32. The outer frame 40 comprises an outer-frame transverse bar 41 and two outer-frame props 42. Based on where the inner and outer frames 30, 40 are pivotally connected, the inner frame 30 is divided into an upper inner-frame segment 301 and a lower inner-frame segment 302, while the outer frame 40 is divided into an upper outer-frame segment 401 and a lower outer-frame segment 402. In the present embodiment, the upper inner-frame segment 301 has a length equal to the length of the upper outer-frame segment 401, and the lower inner-frame segment 302 has a length equal to the length of the lower outer-frame segment 402. The length of the upper inner-frame segment 301 and the upper outer-frame segment 401 is slightly smaller than the length of the lower inner-frame segment 302 and the lower outer-frame segment 402, thereby the inner and outer frames 30, 40 can be folded to the horizontal more smoothly, without the risk of being stuck due to misplacement. In addition, the inner-frame transverse bar 31 is the lower end of the inner frame 30, and is defined as an inner lower slide shaft 33. Its two ends extend into the lower inner guide tracks 11 to slide therealong. The free ends of the two inner-frame props 32 are the upper ends of the inner frame 30, and each have an inner upper slide shaft 34 extending into the upper inner guide track 21 to slide therealong. The outer-frame transverse bar 41 is the lower end of the outer frame 40, and is defined as an outer lower slide shaft 43. Its two ends extend into the lower outer guide tracks 12 to slide therealong, and the free ends of the two outer-frame props 42 are upper ends of the outer frame 40,

each having an outer upper slide shaft 44 extending into the upper outer guide track 22 to slide therealong.

[0043] The gas-assisted extension strut 5 is to provide gas-assisted thrust and is pivotally connected between the inner and outer frames 30, 40, for generating a lifting force when the inner and outer frames have an angle of cross therebetween. In use, it can autonomously generate a push force to expand the crossed and pivotally connected inner and outer frames 30, 40. Therein, the two ends of the gas-assisted extension strut 5 may be pivotally connected to the upper inner-frame segment 301 and the outer frame lower end 402, respectively, or may be pivotally connected to the lower inner-frame segment 302 and the upper outer-frame segment 401, respectively. In the present embodiment, the gas-assisted extension strut 5 has its one end pivotally connected to the outer-frame transverse bar 41, and the other end pivotally connected to the upper inner-frame segment 301 by means of an inner-frame link 35.

[0044] The retaining member 7 is mainly placed on the lower platform 1, and located in the moving route of the inner-frame transverse bar 31 (or the inner lower slide shaft 33). The retaining member 7 is adjustable to limit the slide travel of the inner-frame transverse bar 31, thereby limiting the angle where the inner and outer frames 30, 40 can be pivoted and expand to, and in turn limiting the height where the upper platform 2 can be lifted to. In feasible embodiment, the retaining member 7 may be located corresponding to any of the slide shafts, such as to the inner lower slide shaft 33, to the inner upper slide shaft 34, to the outer lower slide shaft 43, or to the outer upper slide shaft 44. In any of these cases it can limit the pivotal angle between the inner and outer frames 30, 40 by stopping the corresponding slide shaft.

[0045] In practical use, the inner and outer frames 30, 40 each have one end thereof slidably connected to the lower platform 1 or the upper platform 2, and the other end fixedly connected to the lower platform 1 or the upper platform 2, respectively, so as to form a one-side slidable scissor mechanism. The pivot of the inner and outer frames 30, 40 drives the upper platform 2 to move up and down with respect to the lower platform 1. However, in the present invention embodiment, the inner and outer frames 30, 40 each have both ends thereof slidably connected to the lower platform 1 and the upper platform 2, and the inner and outer frames 30, 40 shall have at least one positioning link 6 pivotally linked to and got positioned near the center of the lower platform 1 or the upper platform 2, so as to form a two-side slidable scissor mechanism. With the positioning link 6, the inner and outer frames 30, 40 can perform pivot centrally and is limited to the range defined by the positioning link 6. In general, the positioning link 6 can be a lower positioning link pivotally linked to the lower platform 1 or an upper positioning link pivotally linked to the upper platform 2. As shown in FIGS. 1 through 4, in the present embodiment, the lower outer-frame segment 402 is pivotally provided with a lower positioning link 61, and the lower positioning link 61 is further pivotally connected to the lower platform 1 to get positioned. The upper inner-frame segment 301 is pivotally provided with an upper positioning link 62, and the upper positioning link 62 is further pivotally connected to the upper platform 2 to get positioned.

[0046] In the present embodiment, upper platform 2 may have a folded-down position and a plurality of folded-up positions. When the inner and outer frames 30, 40 are both

parallel to the lower platform, the upper platform 2 is in the folded-down position, whereas when the inner and outer frames 30, 40 have an angle of cross therebetween, the upper platform 2 is in the folded-up position. As shown in FIGS. 1 and 2, when the retaining member 7 does not form blockage, the upper platform 2 can be lifted to the full height. Alternatively, as shown in FIG. 6, when retaining member 7 forms blockage, the upper platform 2 can only be lifted to a predetermined height.

[0047] In practical use, assuming that the ultra-thin lifting table is initially in its lower, folded-down position (as shown in FIG. 3), the inner and outer frames 30, 40 and the gas-assisted extension strut 5 are at this time all parallel to the horizontal direction of the lower platform 1, so the gas-assisted thrust of the gas-assisted extension strut 5 is unable to push the inner and outer frames 30, 40 to pivot and expand. When a user wants to lift the upper platform 2, he/she can hold the handles 23 at the two sides, and exert a small force to lift the upper platform 2. At this time, the inner and outer frames 30, 40 is driven to pivot with respect to each other and have an angle of cross therebetween, while the gas-assisted extension strut 5 is tilted, so the gas-assisted thrust can work to naturally push the inner and outer frames 30, 40 to expand more, until they reach the maximum possible angle (corresponding to the maximum height to when the upper platform 2 can be lifted to, as shown in FIGS. 1 and 2). The gas-assisted thrust of the gas-assisted extension strut 5 can form a supporting force. Of course, the user may use the retaining member 7 to limit the angle of pivotal expansion of the inner and outer frames 30, 40, thereby adjusting the height to which the upper platform 2 is lifted.

[0048] Also referring to FIG. 3 through FIG. 5, when the device of the present embodiment in its folded-down position, the inner and outer frames 30, 40 are both horizontally received in the lower accommodating space 10 of the lower platform 1. At this time, since the inner and outer frames 30, 40 having the same unit thickness lay flush, the overall thickness of the movable brace 3 is restricted in one unit thickness and received well in the lower accommodating space 10. In addition, the upper accommodating space 20 of the upper platform 2 can receive the entire lower platform 1. At this time, the upper inner guide tracks 21 and the upper outer guide tracks 22 of the upper platform 2 can be received in the lower accommodating space 10, while the upper inner guide tracks 21 are located inside the lower outer guide tracks 12 and the upper outer guide tracks 22 are located outside the lower inner guide tracks 11.

[0049] In feasible embodiments, the retaining member 7 may be realized in any one of various forms, and is not limited to the structure described herein. It can be positioned in the moving route of the inner lower slide shaft 33, of the inner upper slide shaft 34, of the outer lower slide shaft 43, or of the outer upper slide shaft 44, so as to provide blockage and limit how wide the inner and outer frames 30, 40 can pivot with respect to each other. In the embodiment of FIGS. 6 and 6a, the retaining member 7 is located in the moving route of the inner-frame transverse bar 31 (or the inner lower slide shaft 33). At its surface on the lower platform 1 comprises a raised retaining portion 73 and two parallel slots 71. The retaining portion 73 serves to stop the inner-frame transverse bar 31. A positioning piece 72 passes through each of the slots 71 and is screwed into the surface of the lower platform 1, so as to adjustably fixed the retaining

member 7 on a predetermined site on the surface of the lower platform 1. In FIG. 6a, there is also a scale 13 located on the surface of the lower platform 1 beside the retaining member 7 for expressing the height of the folded-up position, so as that the user can visually inspect and directly adjust the retaining member 7 to an expected site, thereby easily controlling the height to which the upper platform 2 is lift, making its use more convenient.

[0050] As shown in FIG. 6b, the retaining member 70 is alternatively in the form of a slider, so that it can be also settled in the moving route of the inner lower slide shaft 33 to limit the travel of the inner lower slide shaft 33 and to in turn limit the pivot range of the inner and outer frames 30, 40. In this example, the retaining member 70 is located in one of the lower inner guide tracks 11 and is slidable with respect to the lower inner guide track 11. There is also an adjustable positioning piece 74, which can pass through a slot 110 formed at the lateral of the lower inner guide track 11 and engage with the retaining member 70. Through adjusting the positioning piece 74 by screwing or unscrewing it, the positioning piece 74 and the retaining member 70 can tightly sandwich the lateral wall of the lower inner guide track 11 and form fixation, thereby stop the lower inner guide track 11 at a predetermined length to prevent the inner lower slide shaft 33 from moving therebeyond.

[0051] Furthermore, also referring to FIGS. 6c and 6d, the positioning piece 74 may further pass through a washer 75, and uses the washer 75 to enhance the sandwiching fixation. The washer 75 may be coupled to a rotatable hook 76. The hook 76 is configured to hook an extension portion 330 of the inner lower slide shaft 33 jutting out of the slot 110, thereby fixing the relative position between the retaining member 70 and the inner lower slide shaft 33. In this manner, the upper platform 2 can be held at the predetermined height without the risk of falling or swaying when receiving sudden pressure, thereby improving use stability. Additionally, in this example, a scale 111 may be provided at the top surface of the lower inner guide track 11 for expressing the height of the folded-up position, and an indicator 701 in the form of an arrow mark is extended outward from the retaining member 70. The combination of the indicator 701 and the scale 111 allows the user to visually check and directly adjust the retaining member 70 to a desired site, thereby easily controlling the height to which the upper platform 2 is lifted and improving convenience.

[0052] Also referring to FIGS. 7 and 7a, the inner and outer frames 30, 40 are crossed and pivotally connected by means of a cross pivot 8. The cross pivot 8 may have a buffering member 81 located between the inner and outer frames 30, 40. The buffering member 81 may be a torsion spring, and is such configured that when the inner and outer frames 30, 40 pivot to a predetermined angle it starts to generate a buffering force. As shown in the present embodiment, when the platform 2 is lowered gradually, as the gas-assisted extension strut 5 is tilted gradually, it provides less and less vertical supporting force, so when the inner and outer frames 30, 40 pivot to an angle very close to being parallel to the lower platform 1 (or being in the folded-down position), the buffering member 81 starts to receive pressure and to provide the buffering force.

[0053] In the present embodiment, the gas-assisted extension strut 5 comprises an outer rod 51 and an inner rod 52 that are telescoped for extension and retraction. Further, as shown in FIGS. 8 and 8a, a spring member 53 may be

mounted around the inner rod. The spring member 53 is usually a spring. When the gas-assisted extension strut 5 retracts to a certain site, the spring member 53 is compressed and generates a restoring push force, thereby enhancing the lifting force of the gas-assisted extension strut 5.

[0054] To sum up, the disclosed ultra-thin lifting table is structurally simple and light, and the nested structure helps to minimize the minimal thickness when the lifting table is folded down, so as to allow its users to use arbitrarily and comfortably. The present invention has been described with reference to the preferred embodiments and it is understood that the embodiments are not intended to limit the scope of the present invention. Moreover, as the contents disclosed herein should be readily understood and can be implemented by a person skilled in the art, all equivalent changes or modifications which do not depart from the concept of the present invention should be encompassed by the appended claims.

What is claimed is:

1. An ultra-thin lifting table, comprising:

a lower platform;

an upper platform, being located above the lower platform and configured to move up and down with respect to the lower platform, and having a folded-down position and at least one folded-up position;

a movable brace, comprising an inner frame and an outer frame that are crossed and pivotally connected to each other, the inner and outer frames being nested together and installed between the upper and lower platforms, the inner and outer frames each having two ends thereof slidably connected to the lower platform and the upper platform, respectively, so that pivot performed by the inner and outer frames drives the upper platform to move up and down with respect to the lower platform, the inner frame or the outer frame being pivotally provided with at least one positioning link pivotally linked to the lower platform or the upper platform to get positioned, so that the movable brace is allowed to pivot and slide with a travel of the positioning link, the inner frame comprising two inner-frame props and an inner-frame transverse bar connected to ends of the two inner-frame props, the outer frame comprising two outer-frame props and an outer-frame transverse bar connected to ends of the two outer-frame props, the two inner-frame props being crossed and pivotally connected to the two outer-frame props, respectively; the inner frame including an upper inner-frame segment and a lower inner-frame segment bordered at where the inner-frame props are crossed and pivotally connected to the two outer-frame props, the outer frame including an upper outer-frame segment and a lower outer-frame segment bordered at where the inner-frame props are crossed and pivotally connected to the two outer-frame props, the upper inner-frame segment having a length equal to a length of the upper outer-frame segment, the lower inner-frame segment having a length equal to a length of the lower outer-frame segment, and the length of the upper inner-frame segment being greater than or smaller than the length of the lower inner-frame segment, so that when the inner frame and the outer frame are both parallel to the lower platform, the upper platform is in the folded-down position and parallel to the lower platform, and when the inner frame and the

outer frame have an angle of cross therebetween, the upper platform is in the folded-up position and parallel to the lower platform; and

- a gas-assisted extension strut, providing a gas-assisted thrust and being pivotally connected between the inner and outer frames, for forming a lifting force when the inner and outer frames have an angle of cross therebetween;

wherein, the inner frame and the outer frame has an identical unit thickness, and when the upper platform is in the folded-down position, the inner and outer frames are nested together and parallel to the lower platform so that the movable brace has an overall thickness that is equal to one said unit thickness.

2. The ultra-thin lifting table of claim 1, wherein the lower platform has a surface thereof depressedly formed with a lower accommodating space of the unit thickness, so that when the upper platform is in the folded-down position, the inner frame and the outer frame are horizontally placed in the lower accommodating space.

3. The ultra-thin lifting table of claim 2, wherein the upper platform is greater than the lower platform in terms of area, and the upper platform has a bottom surface thereof depressedly formed with an upper accommodating space of at least the unit thickness, so that when the upper platform is in the folded-down position, the lower platform is received in the upper accommodating space.

4. The ultra-thin lifting table of claim 1, wherein the gas-assisted extension strut has two ends thereof pivotally connected to the upper inner-frame segment and the outer frame lower end, respectively, or pivotally connected to the lower inner-frame segment and the upper outer-frame segment, respectively.

5. The ultra-thin lifting table of claim 1, wherein the positioning link comprising at least one lower positioning link and at least one upper positioning link, the lower outer-frame segment is pivotally provided with the lower positioning link, and the lower positioning link is further pivotally connected to the lower platform to get positioned, while the upper inner-frame segment is pivotally provided with the upper positioning link, and the upper positioning link is further pivotally connected to the upper platform to get positioned.

6. The ultra-thin lifting table of claim 1, wherein each of the inner-frame props has its lower end connected to a lower inner guide track on a top surface of the lower platform through an inner lower slide shaft, and each of the inner-frame props has its upper end connected to an upper inner guide track on a bottom surface of the upper platform through an inner upper slide shaft, while each of the outer-frame props has its lower end connected to a lower outer guide track on the top surface of the lower platform through an outer lower slide shaft, and each of the outer-frame props has its upper end connected to an upper outer guide track on the bottom surface of the upper platform through an outer upper slide shaft, in which the lower inner guide track, the upper inner guide track, the lower outer guide track, and the upper outer guide track are parallel to each other, and when the upper platform is in the folded-down position, the lower inner guide tracks are inside the upper outer guide tracks while the upper inner guide tracks are inside the lower outer guide tracks.

7. The ultra-thin lifting table of claim 6, wherein the length of the upper inner-frame segment is smaller than the

length of the lower inner-frame segment, and the inner-frame transverse bar is defined as the inner lower slide shaft while the outer-frame transverse bar is defined as the outer lower slide shaft.

8. The ultra-thin lifting table of claim 7, wherein the gas-assisted extension strut has one end thereof pivotally connected to the outer-frame transverse bar, and an opposite end thereof pivotally connected to the upper inner-frame segment.

9. The ultra-thin lifting table of claim 7, wherein a positionally adjustable retaining member is set in a moving route of any one of the inner lower slide shaft, the inner upper slide shaft, the outer lower slide shaft, and the outer upper slide shaft, in which the retaining member is adjusted to limit a range the corresponding slide shaft is allowed to slide, thereby limiting an angle the inner and outer frames are allowed to expand, and in turn limiting a maximum height where the upper platform is allowed to be lifted to.

10. The ultra-thin lifting table of claim 9, wherein the retaining member is set in the moving route of the inner lower slide shaft, and located at the top surface of the lower platform, in which the retaining member has a raised retaining portion for retaining the inner-frame transverse bar, and two parallel slots each for a positioning piece to pass therethrough and be screwed into the top surface of the lower platform, thereby adjustably fixing the retaining member to the top surface of the lower platform.

11. The ultra-thin lifting table of claim 9, wherein the retaining member is set in the moving route of the inner lower slide shaft, and is located in one of the lower inner guide tracks, in which the retaining member is configured to slide with respect to the lower inner guide track and to engage with an adjustable positioning piece, so as to fix a relative position of the retaining member in the lower inner guide track, thereby retaining the inner lower slide shaft when the retaining member is fixed.

12. The ultra-thin lifting table of claim 11, wherein the lower inner guide track is laterally formed with a slot, and the inner lower slide shaft has an extension portion jutting out of the slot, while the positioning piece passes through the slot from outside to engage with the retaining member, in which the positioning piece is coupled with a rotatable hook for hooking the extension portion to fix the relative position between the retaining member and the inner lower slide shaft.

13. The ultra-thin lifting table of claim 12, wherein a scale is provided at an outer side of the lower inner guide track for expressing a height of the folded-up position, and an indicator is extended outward from the retaining member to be aligned with the scale.

14. The ultra-thin lifting table of claim 9, wherein the inner and outer frames are crossed and pivotally connected through a cross pivot, and the cross pivot further has a buffering member, in which the buffering member is located between the inner and outer frames so that when the inner and outer frames pivot are almost parallel to the lower platform, the buffering member receive pressure and provides a buffering force.

15. The ultra-thin lifting table of claim 14, wherein the gas-assisted extension strut comprises an outer rod and an inner rod that are telescoped for extension and retraction, and a spring member is further mounted around the inner rod to provide a return force after receiving a pressure.

16. The ultra-thin lifting table of claim **15**, wherein the upper platform has its two sides further provided with projecting handles for convenient grip and operation.

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